Claims

- 1. A process for continuously regenerating catalyst particles, wherein the deactivated catalyst particles pass downwards in sequence through the first coke-burning zone, second coke-burning zone, oxychlorination zone, and calcination zone, and are contacted, in the first coke-burning zone, with the regeneration gas from the second coke-burning zone, the supplemented dry air and a inert gas; after coke-burning in the first coke-burning zone, said regeneration gas is withdrawn from the regenerator via the first coke-burning zone, and after the recovery system, is recycled to the second coke-burning zone, where it is contacted with the catalyst particles from the first coke-burning zone.
- 2. The process according to claim 1, wherein said recovery system comprises a drying step.
- 3. The process according to claim 1, wherein the regeneration gas may pass through the catalyst bed of the second coke-burning zone along the radial direction in a centrifugal or centripetal manner, and then pass through the catalyst bed of the first coke-burning zone along the radial direction in a centrifugal or centripetal manner.
- 4. The process according to claim 1, wherein the regeneration gas may pass through the catalyst bed of the second coke-burning zone along the radial direction in a centrifugal manner, and then pass through the catalyst bed of the first coke-burning zone along the radial direction in a centrifugal manner.
- 5. The process according to claim 1, wherein the operating pressure of the regenerator is in the range of 0.3-0.9 MPa.
- 6. The process according to claim 1, wherein the water content in the regeneration gas entering the second coke-burning zone is 10-200 ppmv.
- 7. The process according to claim 1, wherein the oxygen content in the regeneration gas at the inlets of the first and second coke-burning zones is in the range of 0.2-1.0 v%.
 - 8. The process according to claim 1, wherein the temperature of the

regeneration gas entering the first coke-burning zone is in the range of 410-480°C.

- 9. The process according to claim 1, wherein the temperature of the regeneration gas entering the second coke-burning zone is in the range of 480-520°C.
- 10. A process for continuously regenerating catalyst particles, comprising: passing deactivated catalyst particles from moving-bed reactors downwards in sequence through the first coke-burning zone, second cokeburning zone, oxychlorination zone, and calcination zone by means of gravity; introducing a dry oxygen-containing gas from the bottom of the second coke-burning zone, with the inlet temperature of said gas being in the range of 480-520°C; passing said gas through the catalyst bed of the second coke-burning zone along the radial direction in a centrifugal or centripetal manner to burn off the small amount of coke on said catalyst particles; cooling the regeneration gas from the second coke-burning zone to 410-480°C by adding dry air for supplementing oxygen and adding a dry inert gas, and introducing said regeneration gas into the first coke-burning zone: passing said regeneration gas through the catalyst bed of the first coke-burning zone along the radial direction in a centrifugal or centripetal manner to burn off most of the coke on said catalyst particles; withdrawing said regeneration gas from the regenerator and mixing it with the outlet gas from the oxychlorination zone; subsequently after the recovery system including a drying step, introducing said regeneration gas into the compressor; heating the compressed dry gas to 480-520°C and recycling it to the second coke-burning zone, thus forming a closed circuit; wherein the oxygen content in the regeneration gas at the inlet of each coke-burning zone is in the range of 0.2-1.0 v%, the water content in the regeneration gas entering the second coke-burning zone is in the range of 10-200 ppmv; and the operating pressure in the regenerator is in the range of 0.3-0.9 MPa.
- 11. The process according to claim 1 or 10, wherein said inner screen of the first coke-burning zone may either be a cylinder with a uniform

diameter, or a tapered cylinder with reduced diameters from the top downwards.

- 12. The process according to claim 11, wherein the diameter of said inner screen may be gradually reduced linearly from the top down with its minimal diameter being 60-90% of its maximal diameter.
- 13. The process according to claim 11, wherein the diameter of said inner screen may be reduced at the point of 40-60% from the top of the height of the first coke-burning zone in a straight down manner so that the diameter at the bottom of said inner screen is 60-90% of the diameter at the top of said inner screen.
- 14. The process according to claim 1 or 10, wherein said inner screen of the second coke-burning zone is a cylinder in shape.

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